March 2011

Energy Services BULLETIN

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Tri-State G&T ramps up energy-efficiency program in 2011

Recognizing the demand for additional energy-efficiency programs across their four-state service territory, Tri-State Generation and Transmission Association is making a big investment in its energy-efficiency programs. In 2011, the generation and transmission cooperative's 44 member systems will have access to a number of new and existing rebate options to help co-op consumers save money and use energy wisely. Energy Marketing Coordinator Keith Emerson explained, "Expanding our energy efficiency offerings will help Tri-State avoid purchased power costs, give our member systems more options to meet their customers' needs and introduce new products to consumers."

Program components focus on three categories:

- Deployment programs for proven energy-saving technologies
- Pilot programs to promote less well-known technologies
- Educational opportunities

Marketing Coordinator Ron Ebenkamp explained that Tri-State is expanding and fine-tuning the program, rather than reinventing it. "Our member systems are asking for a larger menu of incentives," he said. "It makes sense because not only are the systems spread over a wide geographic territory, their customer bases are growing more diverse, too."

Ray Pierotti (right) of Tri-State member system LaPlata Electric Association presents a rebate check to the City Market manager for upgrading the refrigeration case lighting to LED technology. Tri-State is expanding its lighting incentives for commercial and industrial customers. (Photo by LaPlata Electric Association)

System-wide efficiency

Member feedback wasn't the only factor Tri-State considered in the decision to increase its program offerings for energy efficiency. The G&T commissioned a study last year to get a better understanding of energy efficiency as a resource. The comprehensive assessment, released in March 2010, identified opportunities for consumer energy-efficiency and demand-reduction measures across its four-state system.

While the study did not offer precise goals, it provided Tri-State and its member systems with target ranges of achievable energy efficiency. Those targets are helping Tri-State refine its established programs to overcome implementation barriers, and to set priorities for new programs.

Emerson pointed out that the study had a broader focus on system efficiency in general. "We looked closely at load management practices, now and in the future, and at the potential of energy efficiency as a resource for system planning." he stated.

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What's inside

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New, improved credits

The study led Tri-State to not only expand its energy efficiency offerings, but to make them more accessible, as well.

Lighting incentives, especially for commercial applications, expand significantly in the new offerings, reflecting consumer awareness as well as opportunity. "Our lighting program has really taken off in the last two years," Emerson observed. "And lighting efficiency is still low-hanging fruit that hasn't been maximized yet."

Member Systems offering standard lighting retrofits will soon be able to apply for incentives using Tri-State's new, streamlined "prescriptive" form for commercial lighting replacements. "As the year goes on, we intend to increase the number of fixture replacements that fall under this simplified method," said Emerson.

Member systems can also offer their consumers energy efficiency credits for efficient HVAC systems, water heaters, appliances and electric motors. "Consumer awareness of Energy Star appliances has really grown in the last couple of years, so we expanded that part of the program to help our member systems meet the demand," Ebenkamp observed.

Technology, education

Heat pump water heaters became eligible for energy efficiency credits in 2011 following a successful pilot program last year. Tri-State offers additional incentives to member systems for testing promising new systems and equipment. Current pilot projects are demonstrating LED lighting in different applications, submersible irrigation pumps and variable speed drive (VSD) motors.

Tri-State is investigating VSD motors because the technology is evolving rapidly and new motor efficiency standards have gone into effect. Lighting is another area where the program has had to change with the times. "We reduced our CFL rebate from $1 to $0.50 per lamp, since consumers can buy a 12 pack of 60-watt equivalent CFLs at Home Depot for about $1.29 each," Emerson said. "CFLs are a technology success story."

The more technology changes, however, the more the need for education stays the same. The education component of the expanded program highlights the diversity of Tri-State's member systems. The seminars and workshops Tri-State co-sponsors with its members will take a more targeted approach—another change sparked by the study. "For example, when we do a seminar on advanced irrigation techniques, we will look for speakers who have an in-depth understanding of local conditions," Ebenkamp said.

Other education and outreach programs include a low-income weatherization package to help member systems participate in their state programs, and incentives for energy audits. Tri-State is covering up to 50 percent of the costs for commercial refrigeration audits, and up to 75 percent of the audit costs for member systems' industrial and agricultural customers.

Historic support

The latest changes to Tri-State's energy-efficiency program carry on a tradition of support for wise energy use that goes back to 1986. "It started as a way to help member systems build and shape their loads," Emerson recalled. "They were looking for ways to get irrigation customers to go electric."

Electric irrigation equipment, along with other load management tools like electric thermal storage and thermal slab units are still part of Tri-State's program. "Those systems work very well for our winter peaking members," Ebenkamp said.

To serve member systems scattered from Wyoming to New Mexico, Tri-State's energy-efficiency program had to be flexible from the beginning. The program has proven its value over and over again in customer satisfaction. "It's harder for large investor-owned utilities to roll out the kind of customized programs our members offer because they don't have the same kind of relationship with their consumers," said Emerson.

Energy Services Bulletin

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Editor: Kevon Storie
Designer: Grant Kuhn

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/mar/mar111.htm

Tribes share successes, lessons learned at TEP annual meeting

Members from more than 55 Native American tribes gathered in Denver, Colo., last October to learn from one another's experiences developing renewable energy and energy-efficiency projects on tribal lands.

The DOE Tribal Energy Program's (TEP) annual program review meeting is a unique networking opportunity that attracted more than 200 attendees in 2010. "The meeting has expanded significantly since the program began in 2002," said TEP Project Manager Lizana Pierce. "This year's meeting truly reflects the expansive amount of in-depth knowledge of renewable energy and energy development the tribes have gained over the years."

Resources, obstacles

TEP works with tribes to promote tribal energy self-sufficiency, economic development and employment on tribal lands through renewable energy and energy-efficiency technologies.

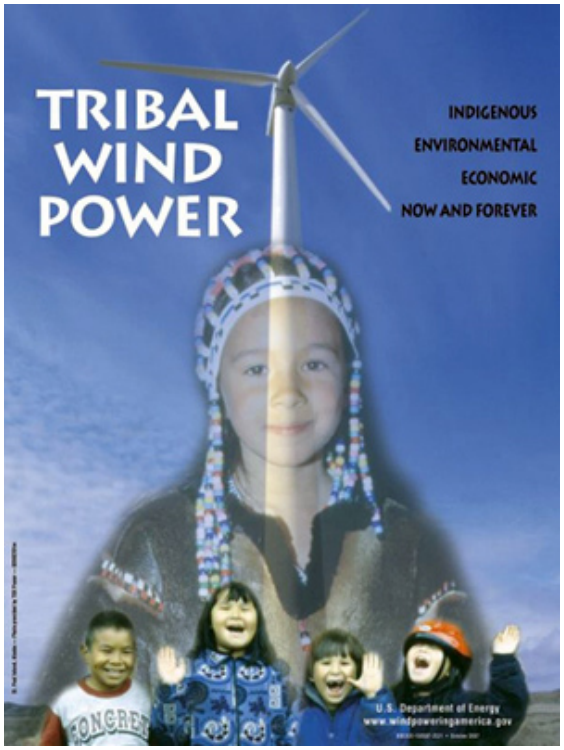
Indian country has tremendous renewable resources to contribute to those goals, according to a study by the National Renewable Energy Laboratory. Wind potential on tribal lands in the lower 48 states is about 14 percent of 2004 U.S. annual electric generation, or about 535 billion kWh annually. Solar potential is 17,600 billion kWh annually—about four times greater than the nation's total electric generation in 2004.

However, the "usual suspects" of financing, permitting and transmission that challenge renewable development everywhere can be outright barriers for tribes. Because of Federal tax laws, tribes have not been able to use the tax incentives that typically make or break the economics of a renewable project. Also, most tribal lands are Federal trust lands, subject to additional environmental and permitting regulations. In recent years, some legislative progress has been made in improving the permitting process for energy development on Indian lands.

Projects in every stage

Still, the barriers have not kept tribes from trying to advance projects. Many tribes have used the opportunities provided by the TEP to lay the foundation for successful projects. To date, TEP has funded 129 projects, including 68 feasibility studies for diverse renewable energy and energy-efficiency projects. Another 48 projects were funded for planning and training—what TEP describes as first steps: strategic energy planning, analyzing energy options and load and educating decision makers and the labor pool. Eleven projects have reached the development phase, fulfilling the legal and financial requirements before construction begins, and eight are "ready to turn dirt."

Several Western customers were among the tribes sharing their experiences in every phase of development. The Lower Sioux Indian Community conducted a feasibility study that led the tribe to drop plans for a community-scale wind farm in favor of a behind-the-meter 1.5-MW turbine to power its casino. The Fort Peck Tribes delivered a status report on their feasibility analysis of geothermal resources on the Fort Peck Reservation in northeastern Montana. Veteran wind developer, the Rosebud Sioux Tribe, reported on its efforts to develop the 190-MW North Antelope Highlands wind farm.



An estimated 10 percent of U.S. energy resources (renewables and conventional) are located on Indian lands. The Tribal Energy Program supports tribal projects to develop those resources for energy self-sufficiency, economic development and employment. (Artwork by U.S. DOE Tribal Energy Program)

Efficiency matters

According to the Building Science Academy (BSA), tribal households pay significantly more in home energy expenses than other Americans, so using energy wisely is just as important as generating it. Pierce said that five energy-efficiency projects are currently in the development or deployment phase. Tribes implement

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TEP Annual Meeting

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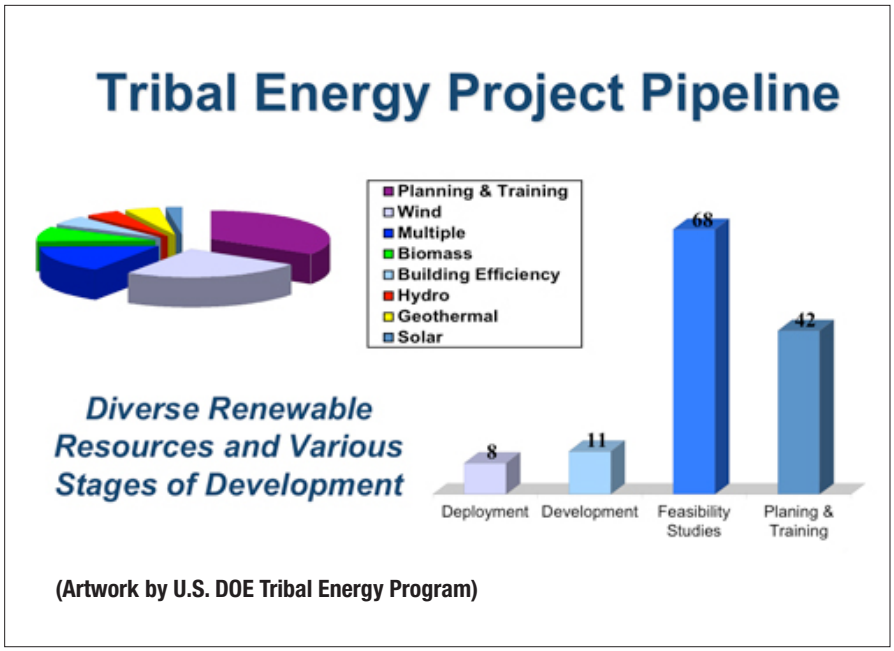
these projects to reduce energy costs and improve the quality of life for their members. The agenda included several presentations on energy-efficiency programs.

Some of those projects focus on reducing carbon footprints by improving the efficiency of tribal facilities. The Forest County Potawatomi Tribe in Wisconsin are performing energy audits on tribal-owned buildings and have identified more than 100 measures that offer substantial energy savings. Projects include replacing parking lot lights with LED lamps at the Potawatomi Bingo Casino, and a proposed retrofit of the tribe's Wundar Community Hall.

In Alaska, where the average electricity cost is $.22 per kWh and heating oil averages more than $5 per gallon, the Rural Alaska Community Action Program, Inc. is training Energy Wise crews in Native communities. The crews put on educational energy fairs and visit homes to install $300 worth of low-cost efficiency improvements. The program reported that installing compact fluorescent lights alone resulted in $128 annual electricity savings—a big achievement in communities where 30 percent of the residents live below the poverty line.



(Artwork by U.S. DOE Tribal Energy Program)

Jobs and training

Weatherization can potentially create jobs on the reservation, too, but many tribes must first train their workforce with specialized skills. The Keweenaw Bay Indian Community in Michigan developed a weatherization training program in collaboration with the BSA and local community assistance programs. So far, the program has graduated nine Building Performance Institute-certified energy auditors and eight certified envelope professionals. A total of 38 individuals have attended the BPI air sealing/insulation and contractor installation training.

While weatherization can deliver many benefits to tribes in the near term, some members are studying hard to prepare for the energy future. TEP offers internships for current college upper-classmen and graduate students, who work on technical project teams at Sandia National Laboratories. Internships give students experience in fields such as long-term energy planning, green building science, renewable energy technology and more.

To be eligible for a TEP internship, the student applicant must be a Native American U.S. citizen with specific interest in renewable energy. For information on the application process, download the 2011 registration form (225 kb pdf) or contact Sandra Begay-Campbell at 505-844-5418.

Other assistance

The projects highlighted at the TEP annual program review show tribes tackling their energy and economic challenges with creativity and community spirit. They also demonstrate the wealth of resources the Tribal Energy Program has to offer.

In addition to the internship program, workshops and webinars, TEP offers publications and technical assistance to help move projects forward. Tribes can access information about project financing and government grants through TEP, as well. The program also has contacts with other energy organizations and can coordinate government-to-government partnerships.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/mar/mar112.htm

Utilities urged to contribute to wind O&M guidebook update

Back in the day—around 2007—utilities that owned wind farms usually contracted with the developer or another vendor to operate and service their facilities. The Los Angeles Department of Water and Power (LADWP) broke with tradition when it opted to train city workers to do the operation and maintenance (O&M) on a wind farm the city was building to meet its renewable energy goals.

It was such a novel idea, someone wrote a book about it. Western teamed up with LADWP, American Public Power Association's (APPA) DEED program and Wind Powering America to publish Establishing an In-house Wind Maintenance Program. The guidebook documenting LADWP's experience, challenges and lessons learned came out in 2008.

Time marches on

That's a lifetime ago in renewable energy industry years, and a lot has changed. The recession, a new administration, the Recovery Act, battles over tax credits and energy and environmental policy have all had an effect on development. In spite of the ups and downs, deployment spread, supplying more data about equipment performance which, in turn, advanced turbine and tower technology.

Perhaps most significantly, states, municipalities, businesses and power providers have been setting their own goals for renewable energy use, and are looking at creative solutions to reach them. This trend has lured entities with no previous in-house O&M experience to launch, or at least consider launching, their own in-house maintenance programs.

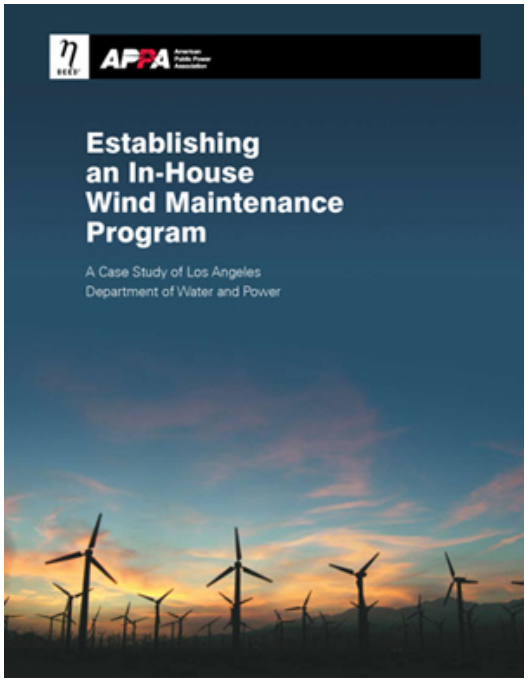
Clearly, the guidebook is ripe for an update that brings these voices into the conversation. The process began earlier this year when the partnership drafted an industry assessment and invited utilities to offer their input.

Same concerns

New partners, too, have joined original team, which included energy developer EnXCo, Nebraska Power Association (NPA), Nebraska Public Power District (NPPD) and Sandia National Laboratories (SNL). Basin Electric Power Cooperative (BEPC), the National Rural Electric Cooperative Association (NRECA) and Utility Wind Integration Group (UWIG) are participating in the update.

The first edition of the guidebook addressed the steps necessary for a utility to set up as well as implement an in-house program. The first chapters covered the warranty option, and identified the key elements of an O&M program, including safety and risk determination, training and planning. The implementation section focused on equipment improvements, staffing, budgeting, maintenance equipment and spare parts, reliability programs and resources available to support an O&M program.

The challenges of in-house O&M are largely the same today as they were three years ago, but wind technology, facilities and stakeholders have matured. Many utilities are weighing extended warranty options as original contracts with developers near their end. Increased turbine size, lifts and condition-monitoring systems have changed maintenance and staff training needs. Most of all, more utilities now have first-hand experience with wind power that they can share.



Wind technologies, facilities and stakeholders have matured since the guidebook was published in 2008. Western customers have much to add to the next edition.

Taking the DIY route

To keep that experience in-house, Energy Northwest set up an O&M program to service its Nine Canyon Wind Farm in 2003. "We own and operate our own hydropower and nuclear facilities, so it was a given that we would do the same for our wind farm, too," explained Steve Wotruba, O&M and professional services manager for the public power wholesaler. "It's better to train our

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ask the energy experts

Estimating electricity costs for workplace appliances

Question:

Do you have information about the cost of running various commercial and industrial (C&I) appliances?

Answer:

While there are many guides listing electricity costs for home appliances, it's not so simple for workplace electronics. For most C&I appliances, there are too many variables to come up with a simple list of cost estimates. Instead, you may find these two formulas to be useful, along with the additional resources.

Use the following formula from the U.S. DOE Office of Energy Efficiency and Renewable Energy to estimate the amount of energy a specific appliance consumes:

(Wattage X Hours Used Per Day)/1000 = Daily Kilowatt-hour (kWh) consumption (1 kilowatt (kW) = 1,000 Watts)

Multiply this by the number of days you use the appliance during the year for the annual consumption. You can then calculate the annual cost to run an appliance by multiplying the kWh per year by your local utility's rate per kWh consumed.

Since you mentioned motors, here is a formula for determining the annual cost of running a motor:

Annual Cost = (HP X 0.746 X hours X load X utility kWh rate)/ (efficiency)

Where:

- HP = horsepower rating
- hour = annual running time (Constant running time is 8,760 hours)
- load = loading, e.g. 0.75 for a motor loaded to only three quarters of its rating. 0.75 is sort of an industry average loading.
- Utility kWh rate = the cost of electricity in dollars per kWh. Average may be around $0.06.
- efficiency = efficiency as a decimal, e.g. 0.92
- Example: A 100 HP motor that runs 6,000 hours per year at 75 percent of maximum load and 92 percent efficiency for six cents per kilowatt hour costs $21,893 per year to run.

Additional Resources

Here are some related web sites that might help your commercial and industrial customers determine the cost of running appliances:

- *Energy Cost Calculators for Energy-Efficient Products* Calculators developed by the Federal Energy Management Program allow visitors to enter their own input values (e.g., utility rates, hours of use, etc.) to estimate energy cost savings from buying more efficient products. Some are web-based tools; others are Excel spreadsheets provided by Energy Star.
- *Energy Star Buildings and Plants* Among the many resources available here, visitors can download free software for evaluating the cost effectiveness of upgrading fans, chillers, lighting and more. A menu of specific types of businesses and organizations helps to narrow your search.
- *U.S. Department of Energy's BestPractices program* Find tip sheets, software tools and a wealth of publications offering energy management strategies for industrial plants. The BestPractices program includes steam, compressed air, motor, and process heating systems.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/mar/mar114.htm

Website of the month:

Green Power Partnership

Firm power customers and Federal agencies that haven't yet decided to participate in Western's annual renewable energy certificate (REC) solicitation might want to visit the Green Power Partnership to brush up on the benefits of acquiring clean energy.

Organizations seeking to "green" their power supply can get expert advice, technical support, tools and resources from this voluntary program of the Environmental Protection Agency (EPA). Partnering with EPA can help an organization lower its transaction costs when buying renewable energy products, reduce its carbon footprint and communicate its leadership to stakeholders. Buying green power is an easy and effective way for businesses, municipalities, school districts or government agencies to improve their environmental performance.

Power shopping

For renewable energy newcomers, the website provides an introduction to the green power market, including a definition of green power: electricity from resources and technologies that offer the highest environmental benefit. This section also explains the difference between voluntary and mandatory markets, and between certified and verified green power.

Visitors who are researching purchasing decisions can learn about the different types of renewable products and product considerations, and get an overview of the purchase process. Organizations planning on using their green power purchase as a marketing tool will find the page on making environmental claims very helpful.

The partnership provides many resources to support organizations that are ready to take a leap and buy green power. One of those, the Guide to Purchasing Green Power, includes much of the information on the website in a downloadable format that can be shared at staff, board and community meetings.

There are tools and calculators to help organizations better understand their energy use, make the business case for green power and communicate its benefits to stakeholders. If local economic development is one reason for choosing green power, the Green Power Locator can help buyers find projects in their state.

Join the club

Once an organization has invested the time and money in buying green power, joining the Green Power Partnership is a great way to maximize recognition for those efforts.

The EPA releases quarterly Top Partner Rankings in 10 different categories. Partners are also eligible for the annual Green Power Leadership Awards. By participating in Partner Initiatives focused on collective buying efforts within specific sectors, organizations can increase awareness in their industry or community about green power.

Sharpen your knowledge

The Green Power Partnership offers educational opportunities throughout the year, and you don't have to be a member to participate. Frequent webinars explore such topics as green power technologies and products, and information on procuring green power. Presentations, recordings and other materials can be downloaded on the website.

Visitors can further their education with an extensive list of publications about purchasing green power and about the Green Power Partnership. A series of PowerPoint presentations is available to help communities—and utilities—increase involvement and participation in green power programs.

Editor's note: *Western customers, take the first step toward becoming a Green Power Partner by joining us March 8 at 10 a.m. MST for a webinar covering the steps for participating in our annual REC purchase. To register, call Debbie Rock at 720-962-7271.*

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/mar/mar115.htm

Guidebook update

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own employees to maintain and service our systems, so we get the benefit of the experience and repair strategy development to mitigate the failures."

Failure in the case of the Nine Canyon project was an atypically high incidence of major component problems. "Now the manufacturer's technicians come out to watch how our technicians replace those parts," Wotruba said.

Wotruba acknowledges taking on O&M can be more daunting for utilities that don't have the owner/operator culture of Energy Northwest or his previous employer FPL Energy. "But it is worth the effort, especially for a new project," he said. "If a utility is committed to renewable energy for the long haul, it pays to have the expertise in-house."

Everyone has a story

Still, just as no one renewable resource matches every load, no single O&M model is going to work for every utility. For its Solano Wind Project, Sacramento Municipal Utility District (SMUD) contracted for a five-year warranty with turbine manufacturer Vestas that it has since extended to 10 years. SMUD plans to double the project's size in 2011, and Vestas will provide full O&M support including all labor and materials for 10 years with an option to extend to 15 years.

As a large municipal utility, SMUD might have similar resources to LADWP, but an O&M contract with Vestas offers many advantages. This service model provides more predictable costs and transfers the equipment risk to the manufacturer. Although SMUD, like LADWP, employs union-represented electrical workers, it doesn't yet have a job classification covering the skills for maintaining a wind turbine.

These are just a few of the considerations utilities must weigh in deciding how to handle O&M for their own wind facilities. SMUD recommends talking to other wind project operators, especially those with the same turbine models, to learn as much as possible.

And utilities with a story to tell can contribute their hard-won wisdom to the next edition of Establishing an In-house Wind Maintenance Program. Fill out the assessment (19 kb .doc) and return it to Guy Nelson by April 1. The book is still being written about the utility industry and renewables, including wind power, and this is your chance to be one of the authors.

Want to know more?
Visit www.wapa.gov/es/pubs/esb/2011/mar/mar113.htm